CORROSION DATA

Corrosion Guide

By Erich Rabald. Second revised edition. Pp. xxxiv + 900. (Elsevier: Amsterdam, London and New York, 1968.) 400s.

SEVENTEEN years have passed since the first edition of this book was published, and in the interval the literature available to the corrosion expert has undergone much change. Several texts and new journals have appeared, all reflecting an increase in the attention devoted to the fundamentals of corrosion science as distinct from the empiricisms of materials selection. Of course, enlightened selection is always based on a proper understanding of underlying mechanisms, but undue emphasis on the latter can lead to a pessimistic atmosphere in which no material can be chosen. This problem is compounded by the tendency of many scientific workers to consider interactions between materials and their environment without regard to the circumstances under which such reactions take place. It is often the engineering circumstances, involving flow, additional phases, the presence of heat transfer and so on which ultimately determine the rate at which materials corrode in practice.

The proper corrective to this trend is adequately recorded and retrievable data based on experience, and it was in this field that Professor Rabald first made his unique contribution. In preparing this edition he recognized the developments in corrosion research, and re-organized the material so as to satisfy more adequately the complementary need for a comprehensive source of data. In so doing the author carefully compiled more than fourteen thousand entries covering the behaviour of more than three hundred and thirty materials when exposed to nearly five hundred different chemicals under a variety of conditions. The book lists under each chemical the corrosion resistance of appropriate materials, briefly indicating the necessary practical details of construction and technology. Corrosion behaviour is classified in simple terms as resistant, fairly resistant, not resistant but used in practice, or unusable. An introductory section on the use of the book amplifies this coding by ascribing quantitative values to the ratings employed. Also included is a useful list of all materials quoted, including their trade names or specification numbers and composition.

The *Corrosion Guide* is thus necessarily a compilation of brief comments, conveniently listed and classified, and contains no discussion of the nature of corrosion or of the methods available for its control. It is also entirely on the conditions encountered in the process side of the chemical industry. This necessarily results in some obvious gaps inasmuch as that there is no treatment of high temperature problems, or of those encountered in combustion processes.

Priced at £20 the book may be found to be beyond the reach of many engineers and most students, but it must find a place in every design office or chemical factory. Regrettably, Professor Rabald did not live to see the publication of a book the preparation of which occupied his later years and which represents such a large part of his life's work.

T. K. Ross

ELECTRIC MACHINES

Electrodynamics of Electrical Machines

By M. Staffl. English translation edited by G. A. Toombs. Pp. 183. (Academia: Prague; Iliffe: London, 1967.) 45s.

THE solution of Maxwell's equations with given boundary conditions is almost the day to day problem of the machine designer engaged in development or the research worker

trying out new arrangements of electrical machines. Like his earlier book on edge effects, the author has collected together in one volume a great deal of very useful reference material for such workers. He develops his arguments logically and clearly without ever becoming side-tracked.

The volume divides naturally into four parts. The first is an introduction and includes Maxwell's equations and the concepts of the scalar and vector potential functions. The second section is devoted entirely to scalar potential problems, the third to vector potential problems—stationary effects, and the fourth to quasi-stationary effects. Interesting examples are chosen to illustrate the various methods and the book concludes with an appendix containing a summary of mathematical formulae and functions. The translation from the original work in the Czechoslovak Academy of Sciences has been well done and the diagrams are very clearly presented. The book will be useful for final year undergraduates in electrical engineering and for postgraduates and those engaged in industrial development.

E. R. LAITHWAITE

MODERN OPTICS

Introduction to Modern Optics

By Grant R. Fowles. Pp. x + 304. (Holt, Rinehart and Winston: New York and London, 1968.) 122s.

OPTICS has undergone a remarkable expansion in the past few years, and publishers are evidently finding it a profitable field, comparable to that of electronics and solid state physics. This book aims at providing an undergraduate course in modern optics including topics such as lasers, coherence and optical spectroscopy. The influence of Born and Wolf's classical book *Principles of Optics* can be clearly seen in the first four chapters dealing with physical optics. Unfortunately, several important topics are dealt with very briefly. Density interferometry is described mainly by a diagram of the Hanbury-Brown and Twiss experiment and the reader is referred to references at the end of the book for an explanation of the principle. Again the brevity with which diffraction gratings and multiple-beam interferometers are discussed seems out of balance compared with the treatment of topics such as apodization. Surely it is important that undergraduates should be familiar with the modern approach to diffraction gratings, particularly the development of blazed plane gratings by Harrison over the past ten years. The chapter on optics of solids is well written and the difficult topic of non-isotopic crystals is particularly good. The diagrams here are very useful. Indeed, the clarity of the diagrams throughout the book is greatly improved by the use of a single colour in addition to black and white, a technique to be recommended to other publishers in this field. Non-linear optics is naturally introduced at the end of this chapter, where it fits in very appropriately.

The chapter on thermal radiation and light quanta is rather brief and could have been with profit expanded a little. The chapter on optical spectra is a useful summary, but the treatment does not have the depth to be found in a textbook aimed at undergraduate physics students. The final chapter on lasers also suffers from brevity, and a typical example is that no clear distinction is made between spatial hole burning and spectral hole burning in the performance of a laser system.

In conclusion, this book cannot be recommended for undergraduate students in physics, but can be recommended for special courses for introducing students in technology and engineering to the basic principles of modern optics so that they will be familiar with such topics as lasers. Problems at the end of each chapter and the solutions at the end of the book should make this